Candida albicans has traditionally been the most common species in adults & children. However, recent reports indicate emergence of non-albicans Candida as a cause in hospitalized patients.

Antimicrobial fungal susceptibility is not routinely done by most local microbiology laboratories, and the mycology department at our institution has never done antifungal susceptibility testing. All our antifungal therapy is done on an empirical basis.

The purpose of this study was to determine the emerging pattern of Candida species in patients with Candida infection admitted to Dessie Children’s Hospital from January 2001 to December 2011 and to determine the epidemiologic characteristics of these patients. Our other objective was to analyze the antifungal susceptibility among different Candida species using E-test to determine minimum inhibitory concentration (MIC) in order to provide health care providers with information that will allow them to select the appropriate antifungal therapy.

Abstract

OBJECTIVE: To determine the emerging pattern of Candida species in children with Candida infection, their epidemiologic characteristics and Candida spp. susceptibilities.

PATIENTS AND METHODS: Patients with positive Candida growth in body fluids from January 2001 to December 2011 were identified. Charts were reviewed and isolates were tested for antifungal susceptibility and resistance using E-test.

RESULTS: Candida parapsilosis was the predominant species across the years. Important risk factors were presence of intravascular device (96%) and use of broad spectrum antibiotics (94%). C. albicans, C. parapsilosis and C. tropicalis were susceptible to Fluconazole, 99%, 100%, 91% respectively vs. 60% for C. glabrata. Mucor had similar susceptibility patterns. C. parapsilosis was 100% resistant to Caspofungin, while C. albicans was susceptible to Fluconazole and Amphotericin. C. tropicalis and C. glabrata were susceptible to Amphotericin B (97%, 98% and 99% respectively).

CONCLUSIONS: This study identified C. parapsilosis as an emerging species over the last 10 years. Caspofungin is not a good empiric choice for Candida species for C. albicans, C. parapsilosis and C. tropicalis. Fluconazole is a good empiric choice. There is a 45% non-susceptibility to Fluconazole for C. glabrata. Amphotericin B has the least resistance for Candida species.

Description of intervention/study

Charts of patients with positive culture for Candida species from blood or body fluids who were hospitalized from January 2001 to December 2011 were reviewed for demographics and laboratory data. Their stored specimens were identified and retrieved. Specimens were plated and re-plated at 24 hour intervals on Sabouraud Dextrose Agar. Colonies were standardized using Turbidimetry before being plated on a blood agar plate using a Retro C8000 tilt plate. E-test strips for Fluconazole, Voriconazole, Caspofungin and Amphotericin B were laid down using Staphylococcus aureus. After 48 hours of incubation, Minimum Inhibitory Concentrations were determined using the E-Test. The categories were susceptible, intermediate or resistant using breakpoints. Analytical: Descriptive statistics with Microsoft Excel 2007, Mantel-Haenszel for Analysis.

Incidents of Candida species according to Age

<table>
<thead>
<tr>
<th>Age (Years)</th>
<th>Candida Albicans</th>
<th>Candida Parapsilosis</th>
<th>Candida Tropicalis</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-1</td>
<td>50/50</td>
<td>30/70</td>
<td>20/80</td>
</tr>
<tr>
<td>2-5</td>
<td>40/60</td>
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<tr>
<td>6-10</td>
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<td>5/95</td>
</tr>
<tr>
<td>11-15</td>
<td>20/80</td>
<td>5/95</td>
<td>0/100</td>
</tr>
<tr>
<td>&gt;16</td>
<td>10/90</td>
<td>0/100</td>
<td>0/100</td>
</tr>
</tbody>
</table>

Results

Epidemiology of Candida Infections in a Children’s Hospital in South Texas

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Epidemiological Data: We had 104 cases. 39 were male and 45 were female. Mean age was 5 years and 5 months. Twenty four percent were on prophylactic antibiotics and 12% were on intravenous antifungal. Significant risk factors were use of broad spectrum antibiotics (98%) and presence of a vascular device (60%). Eighty six percent of the isolates were from Blood.

Infection Frequency across the years by species: Candida parapsilosis was the predominant species followed by Candida albicans (29%), Candida tropicalis (21%), Candida glabrata (10%) and other species.

Spices for patient location: C. parapsilosis was the predominant isolate in the NICU, C. tropicalis in the ICU and B. albicans and parapsilosis were predominant in the fluid/abscess/infectious tissue in most cases.

Conclusions

Candida parapsilosis was the emerging predominant pathogen in the last 10 years. There was an increase of isolated species found of Candida Albicans and Candida parapsilosis in children less than 1 year old. Candida tropicalis was predominant in children 0-5 years old. Candida glabrata had no age predilection. Significant risk factors were presence of a vascular device and concurrent use of broad spectrum antibiotics. Associations were found with a positive blood culture and a low WBC count and thrombocytopenia. When species were ranked according to patient location, the following were the predominant species in each of the unit: C. parapsilosis was the predominant isolate in the NICU, C. tropicalis in the ICU and both B. albicans and parapsilosis were predominant on the floors. Based on in vitro studies using the E-test, we looked at susceptibility and resistance patterns with the intention of providing information to guide our management. Caspofungin was found to be a poor empiric choice for Candida species. Fluconazole is a good choice for C. albicans, C. parapsilosis and C. tropicalis. Voriconazole showed similar susceptibility patterns to Fluconazole. An important finding was the 49% non-susceptibility of C. glabrata to Fluconazole. Finally, Amphotericin B has the least resistance for all four Candida species and C. glabrata was 100% susceptible to it.

Sensitivity and Resistance

FLUCONAZOLE

VORICONAZOLE

AMPHOTERICIN B

CASPOFUNGIN

References


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